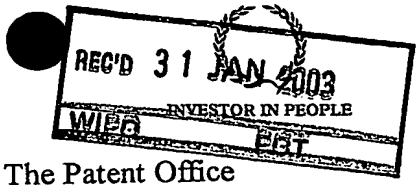
Rec'd PCT/PTO 15 JUN 2004
10/500260
PCT/GB 2002 / 005609

BEST AVAILABLE COPY



The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

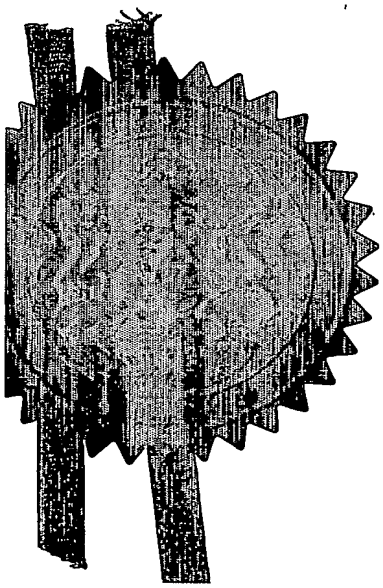
PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.



Signed

Dated 8 January 2003

Patents Form 1/77

Patents Act 1977
(Rule 16)

THE PATENT OFFICE
11 DEC 2001
NEWPORT

The Patent Office
PATENTS • DESIGNS • COPYRIGHT • TRADE MARKS

11DE[illegible]681017-1 010096
P01/7700 0.00-0129577.3

1/77

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

JFH/P60213GB

2. Patent application number
(The Patent Office will fill in this part)

0129577.3

11 DEC 2001

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Superscape Limited
Cromwell House
Bartley Wood Business Park
HOOK
Hampshire
RG27 9XA

Patents ADP number *(if you know it)*

07773981001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

Method and Apparatus for Image Construction and Animation

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Parabola
1 Richfield Place
Richfield Avenue
Reading
RG1 8EQ

Patents ADP number *(if you know it)*

08236465001

~~8016271~~001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

yes

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	2X25
Claim(s)	
Abstract	
Drawing(s)	2X13

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature Parabola. Date 10 December 2001

Parabola

12. Name and daytime telephone number of person to contact in the United Kingdom: John Hardwick 0118 950 9937

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.

b) Write your answers in capital letters using black ink or you may type them.

c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.

d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.

e) Once you have filled in the form you must remember to sign and date it.

f) For details of the fee and ways to pay please contact the Patent Office.

Method and Apparatus for Image Construction and Animation

The present invention relates to apparatus capable of displaying an image (for example, on a screen). More particularly, the present invention relates also to apparatus, capable of displaying an image, and having a very low bandwidth or capacity for receiving or sending images to another apparatus and very low internal processing capacity.

Systems, according to the field of the invention, as recited above, come in many forms. These can range from, but are not limited to, computers, computer terminals, television and video displays, PDA's (personal digital assistants) and higher generation mobile telephones. The discussion and disclosure of the present invention is directed towards mobile telephones. However, notwithstanding this focus of attention, it to be understood that the invention is not limited thereto and can be applied, with advantage, in all of the fields mentioned above.

With the ability to display images, higher generation mobile telephones have sought to exploit images to provide ease and entertainment to the functioning of the mobile telephone. However, each image displayed requires a certain minimum amount of data, either received by the radio link or retrieved from the memory, or both. Until now, each image has been a high data content construct, directly retrieved, or has had a relatively smaller data content, which has required to be expanded by copious processing to turn the small amount of data into an elaborate result. Either way, high bandwidth, high processing capacity, high data storage capacity, or all three, are required. The present invention seeks to provide a method and apparatus whereby a new image can be acquired and displayed with the minimum of bandwidth, processing capacity or data storage.

Progress towards more sophisticated services demands not only that an image should be present, but, if at all possible, that it should

be animated. Animation places an enormous overhead on an already over strained display system. Animation requires the generation or acquisition of multiple views of an object or image, and their application to a display sequence. The present invention seeks to provide means for image animation which considerably reduces the proportional additional overhead usually required in image animation, and place it within the range of capability of a low bandwidth, low memory, low processing capacity system.

Higher generation mobile telephone users seek to employ selectable images and animations in their interactions with other users. Individual images are large, and require high bandwidth, unacceptable delays, and high storage and processing capacity to send and to be received. Even when received once, from a server, for later multiple use, individual images, especially if animated, still suffer from the same limitations and constraints. The present invention seeks to provide means whereby one mobile telephone may send to or receive from another mobile telephone a new animation and/or image with the minimum requirement for bandwidth, time, memory or data processing capacity on the part of either mobile telephone or on the part of the intervening communications system.

According to a first aspect, the present invention consists in a method for generating an image for display; said method including the steps of: selecting a set of part images from among a plurality of part images; specifying a position, to be occupied in the display, for each part image in said set of part images; specifying the properties for each part image in said set of part images; and displaying each part image according to the specifications.

According to a second aspect, the present invention consists in a method for transmitting an image, said method including the steps of: sending a signal to specify a set of part images from among a plurality of part images; sending a signal to specify a position, to be occupied in the display, for each part image in said set of part images; and sending a signal to specify the properties for each part image in said set of part images.

According to a third aspect, the present invention consists in a method for receiving and generating an image, said method including the steps of: receiving a signal to specify a set of part images from among a plurality of part images; receiving a signal to specify a position, to be occupied in the display, for each part image in said set of part images; receiving a signal to specify the properties for each part image in said set of part images; and responding to said signals to generate and display the specified image.

According to a fourth aspect, the present invention consists in an apparatus for generating an image for display; said apparatus comprising: means to select a set of part images from among a plurality of part images; means to specify a position, to be occupied in the display, for each part image in said set of part images; means to specify the properties for each part image in said set of part images; and means to display each part image according to the specifications.

According to a fifth aspect, the present invention consists in an apparatus for transmitting an image, said apparatus comprising: means to send a signal to specify a set of part images from among a plurality of part images; means to send a signal to specify a position, to be occupied in the display, for each part image in said set of part images; and means to send a signal to specify the properties for each part image in said set of part images.

According to a sixth aspect, the present invention consists in an apparatus for receiving and generating an image, said apparatus comprising: means to receive a signal to specify a set of part images from among a plurality of part images; means to receive a signal to specify a position, to be occupied in the display, for each part image in said set of part images; means to receive a signal to specify the properties for each part image in said set of part images; and means, responsive to said signals, to generate and display the specified image.

The present invention further provides for the specification of a viewpoint.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the colour of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the texture of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of a cladding to be applied to each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the orientation of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the size of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the transparency of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the direction of movement or movements of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the type of movement or movements of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the speed of movement or movements of each part image in said set of part images.

The present invention further provides that the specification of the properties of each part image in said set of part images can include specification of the times to be displayed for each part image in said set of part images.

The present invention further provides that the apparatus can be a computer, a personal digital assistant or a mobile telephone.

The present invention further provides that sets of part images can be obtained from a server in a network, and that the network can be a mobile telephone network.

The invention further provides that images and/or animations can be sent or received in the form of a text message.

The invention is further explained, by way of example, by the following description, taken in conjunction with the appended drawings, in which:

Figure 1 is a schematic diagram of the environment in which the preferred embodiment can be practised.

Figures 2A to 2F show how an image of a face can be constructed, according to the present invention.

Figure 2 is a continuous animation sequence, according to the present invention, reading from the top to the bottom, where a pair

of eyes, commencing looking ahead, gaze to their left, centre, right and back to centre.

Figures 4A to 4D show the effects of substituting animation, where a facial expression runs through a sequence by means of replacement of one mouth by another on a sequential basis.

Figures 4E to 4F show the effect of altering the angle of tilt of a part to produce different appearances.

Figures 5A to 5C show how parts can be rotated to produce different types of animation.

Figure 6 shows how an object can be bounced around a screen to produce yet another type of animation.

Figure 7 is a flowchart showing how a mobile telephone, according to the present invention, if short of a part set for creation or reception of an image or animation, can obtain that part set from the server, otherwise shown in Figure 1.

Figure 8 is a flowchart showing how a mobile telephone, according to the present invention, if short of an individual set for creation or reception of an image or animation, can obtain that individual part from the server, otherwise shown in Figure 1.

Figure 9 is a flowchart showing one way in which an image/animation can be assembled.

Figure 10 is a flowchart illustrating how the "specify properties" operation of Figure 9 can be achieved.

Figure 11 is a flowchart showing how an image can be assembled and sent as a text message.

And

Figure 12 is a flowchart showing how an image can be received as a text message.

Attention is drawn to Figure 1, showing the general environment in which the preferred embodiment of the invention is practised.

A mobile telephone 10 is in radio communication with a mobile telephone network base station 12 which is, in turn, connected via the terrestrial telephone network 14 to other base stations 16 and one or more servers 18. The terrestrial telephone network 14 can comprise land lines, high band width cables, and microwave and satellite links. The terrestrial telephone network 14 allows connection to other mobile telephones 20, fixed telephones and fixed computer terminals. A mobile telephone 10 can access a server 18 for data, information and other resources. The base stations 12 can be on any style or generation of mobile telephone system, provided it has the ability to transfer and display images. The mobile telephone 10, which in this example is taken to be a mobile telephone 10 capable of sending and receiving images according to the present invention, comprises a screen 22 capable of displaying images.

The mobile telephone 10 is the preferred method of transmission and reception in the chosen embodiment of the present invention. It is to be appreciated that the present invention encompasses any means for sending and receiving text messages and is not limited to mobile telephones 10, 20 or a mobile telephone network 12, 14, 16. The present invention equally allows, for example, personal digital assistants (PDA), computers and computer terminals to communicate through any other system including, for example, the Internet, by satellite, or by direct wire or cable connection.

Attention is drawn to Figures 2A to 2F, showing one way in which an image can be assembled, according to the present invention.

Figure 2A shows a first stage in a possible process, within the present invention, whereby an image of a (caricature or cartoon) human face may be assembled.

The first stage in assembling an image of a face is to choose the facial outline. The user is presented with facial outlines 24A, 24B and 24C on the screen 22 of the mobile telephone 10. In this example, a selection tick 26 can be moved by the user, under control of buttons on the mobile telephone 10 to lay over a selectable one of the facial outlines 24A, 24B and 24C and then be activated to produce the selective facial outline 28 which, in this case, is a horizontally oblate shape.

Figure 2B shows the next stage in constructing an image of a face, where a selection of eyes 30A, 30B and 30C are presented on the screen 22 to be selected using the selection tick 26. The selected eyes 32 can be placed on selection, within the selective facial outline 28, either automatically in the position that the selective eyes 32 would normally occupy in a facial outline 28, or can be moved around by the user until they are in the satisfactory position.

Figure 2C shows a third stage in the generation in the facial image, where a selection of noses 34A, 34B and 34C are presented on the screen 22 to be selected using the selection tick 26 and placed within the selective facial outline 28, as before, either automatically in the position where the selected nose 36 would normally be positioned in the selected facial outline 28 or positioned in a user selectable spot.

Figure 2D shows a fourth stage in the possible generation of an image of a face, where the user is presented, in the screen 22, with a selection of possible mouths 38A, 38B and 38C. As before, the user uses the selection tick 26 to determine the selected mouth 40 and to position it within the selected facial outline 26.

Figure 2E shows a further stage in the possible construction of an image of face, where the user is presented, within the screen 22, with a selection of possible ears 42A, 42B and 42C. Once again the user employs the selection tick 26 to select for placement the selected ears 44 on the selected facial outline 28.

Finally, in this sequence, Figure 2F shows selection from among a plurality of possible eyebrows 46A, 46B and 46C for the placement of the selected eyebrows 48 on the steadily growing image of a face.

Figures 2A to 2F are provided to illustrate the great diversity of images that can be constructed using a part-by-part method according to the present invention. While each screen 22, in this limited example, is shown with only an option of three selectable items, even on this narrow basis, and up to this stage, a total of eighty-one different faces can be constructed. If hair and hats are added, the possibility rises to seven hundred and twenty-nine different facial images. All this is without any other variations on appearance which are also applicable according to the present invention. In the prior art, each of these seven hundred and twenty-nine different images would have to be sent and stored as a separate entity. By comparison, in this very limited example, assuming the addition of the hair and hats, the entire data for seven hundred and twenty-nine different facial images can be found in just eighteen stored part images which can recalled from a memory and applied to the screen 22.

Attention is now drawn to Figure 3, showing the effect that simple continuous animation can have upon an item, in this example, the selected eyes 32.

The image, stored in the memory for eyes, is in fact spherically symmetric. The eyelids 50, in this example, form a continuous fixed, spherically symmetric shell with a slit opening 52 through which the spherical eyes' surface 54 is visible. The spherical eye surface 54 is able to rotate about an axis of eye surface 56 so that the pupil and the iris can move within the slit opening 52. In the example given in Figure 3, a movement has been specified where the spherical eye surface 54 swings from a straight ahead position first towards the observer's extreme right, back towards the observer's centre, towards the observer's extreme left, and back towards the centre. It is a continuous simple harmonic motion which gives the impression that the eyes are panning left and

right. This is just one example of the manner in which a picture element may be given continuous animation. As will become clear in the later description, other continuous animations are possible.

Attention is drawn to Figures 4A, 4B 4C and 4D which show substitution animation. The sequence, starting with Figure 4A shows a range of different expression on a face 58 created by the simple expedient of substituting which selected mouth 40A, 40B, 40C and 40D is present, in what sequence, and for how long. It is also to be noted that in this sequence, the eyes 32 are seen to be casting about left and right. This can be achieved either by continuous animation as shown in Figure 3, or by substitution animation where selected eyes 32 are substituted for each other, the selected eyes having a fixed stare in a particular direction.

Attention is drawn to Figures 4E, 4F, 4G and 4H showing how a simple angular rotation of a selected item can cause a radical difference in appearance. Here hair bunches 60 are given different selectable angular positions around their attachment points 62 (as indicated by arrows 64) to give either individual fixed images as shown in the individual Figures 4E, 4F, 4G and 4H or a substitution animation, or a continuous animation by continuously varying the angle of tilt, to express "a hair raising experience".

Attention is drawn to Figure 5A showing another form of animation, namely continuous rotation. In the example given, the headgear 66 on the image of the face can be caused to rotate as indicated by arrow 68, at a selectable angular velocity and in a selectable sense about axis 70 to give a pleasing and amusing effect.

Figure 5B shows another example of a sphere 72 rotating at a selectable angular velocity and selectable sense around directable axis 74 as indicated by arrow 76. Directable axis 74 can have its direction of pointing selected. Thus, the axis of rotation 74 of the sphere 72, or any other object to which this animation is applied, can point to wherever the user selects and, of itself, can have its own variation in direction of point.

Figure 5C shows how a decorative object such as a star 78 can be caused to rotate, in the plane of view, about a centre 80 of selectable position at a selectable angular velocity as indicated by arrow 82. This same form of animation can be applied to virtually any item or image which can be created within the compass of the present invention.

Figure 6 shows another form of animation. An object 84 is imparted with a selectable horizontal velocity and a selectable vertical velocity to bounce between boundaries 86 in selectable positions the screen 22, to follow a trajectory 84. The boundaries 86 may be made coincident with the screen of the screen 22, can have gaps sent therein so that the object 84 may come to bounce between the edge of the screen 22 and the other side of the boundary, or can be other than straight. The object 84 itself can be virtually anything and might, for example, be a bird or a other object of fancy placed to decorate the background to a scene by its movement.

So far, various simple examples have been given of images and effects which can be achieved according to the present invention. It would be far too exhaustive to give an example of everything which can be done. It is therefore to be understood that the present invention encompasses any permutation or combination of all or some of the techniques hereinbefore and hereinafter described.

Attention is drawn to Figure 7 showing a flow chart of how a mobile telephone 10 can commence to create scenes and images. While it is preferred that a set of parts is stored within the mobile telephone 10 in a non-volatile memory, this may not always be possible, and different sets of parts can exist. So, from entry 90 a first test 92 detects whether or not the user or the automatic operation of the mobile telephone 10 requires the presence of a new part set in the memory of the mobile telephone 10. This may happen, for example, if an image is received which is not recognisable by its parts to the mobile telephone 10. Alternatively, the user of the mobile telephone 10 may wish to construct images from a different part set. If no new set of parts is required, the routine passes to an exit 94 with no new parts set being acquired. If, however, a

new part set (set of parts) is required, a first operation 96 has the mobile telephone 10 call up the sever 18 (otherwise shown in Figure 1) via the base station 12 and the terrestrial telephone network 14 to request the particular part set for the server 18. A second operation 98 then selects which part set is required and downloads that part set from the server 18. Thereafter the sequence of operations passes to exit 94 to continue with other things.

Figure 8 shows what may occur whilst creating an image or scene. From entry 100 a second test 102 checks to see if a new part is required to complete or to continue to create an image or scene. If not, the operation terminates in exit 104 where the user of the mobile telephone 10 can continue in his creations of the image or scene. If, however, a new part is required, a third operation 106 looks in the memory of the mobile telephone 10 to find the required part. If a third test 108 finds that the required part is in the memory of the mobile telephone 10, a fourth operation 110 selects the required part from the memory and goes to the exit 104.

If the required part is not to be found in the memory of the mobile telephone 10, a fifth operation 112 calls up the sever 18 and a sixth operation 114 selects and downloads the part from the server 18 before passing to the exit 104. In this way, an individual, creating an image or scene on the mobile telephone 10, can obtain parts automatically and seamlessly. The same process of Figure 8 can be applied when receiving an image or scene. If any particular part is missing, it can be obtained and used. This is a better alternative than another means, also within the present invention, where, if a particular nominated part is not present, another part will automatically be substituted.

Attention is drawn to Figure 9 and to Table 1 (printed hereafter). Figure 9 is a flow chart of the steps which are to be taken when creating an image or scene according to the present invention. Table 1 shows examples of different types of parts which can be used when creating an image or scene. Attention is also drawn to

Table 2 listing some possible "properties" which can be used with the present invention.

From entry 116 a seventh operation 118 has the user of the mobile telephone 10 and the mobile telephone 10 co-operate to select a first part type. An array of possible part types is placed on, and possibly scrolled across, the screen 22. The user views the part types and selects one of the part types to be the general kind of part next to be placed upon the screen 22 in forming the image or scene. Having selected the first part type, an eighth operation 120 has the user of the mobile telephone 10 viewing all those different parts in the selected part type. A ninth operation 122 then has the user of the mobile telephone 10 selecting one of the parts of the first part type to be placed in the image or scene.

TYPE OF PART	SELECTABLE PARTS
Face Part	Face outlines, Ears, Eyebrows, Hair, Eyes, Pupils, Mouths, Noses, Lips, Teeth, Tongues, Moles, Scars.
Face Furniture	Spectacles, Monocles, Headgear, Hair Ornaments, Jewellery, Eye Patches, Tattoos
Body Part	Torso, Arms, Legs, Hands, Feet,
Body Clothing	Upper body clothing, Lower body clothing, Shoes, Gloves, Scarves
Accoutrements	Skate boards, Roller Blades, Scooters, Roller Skates, Bicycle, Push Chair, Perambulator
Objects	Household items, Buildings, Computer equipment.
Shapes	Square, Circle, Polygon, Crescent Moon, Stars
Creatures	Cats, Dogs, Horses, Fish, Wildlife, Birds, African, Australian

TABLE 1: DIFFERENT TYPES OF PARTS

At this point attention is drawn to Table 1 which shows, by way of example, different types of parts which can be selected in the seventh operation 188. For example, face parts can include face outlines, ears, eyebrows, hair, eyes, pupils, mouths, noses, lips, teeth, tongues, moles, scars and so on as briefly described with reference to Figures 2A to 2F. Another type of part which could be selected is face furniture which could include spectacles, monocles, headgear, hair ornaments, jewellery, eye patches, tattoos, make-up and so on. Equally, body parts can form a type of part, including torso, arms, legs, hands, feet, to name but a few. Equally body clothing can form a type of part as can equipment, general types of objects such as household items, buildings, computer equipment, different geometric shapes such as squares,

circles, polygons, crescent moon and stars, creatures such as cats, dogs, horses, fish, birds etc and, not shown in Table 1 but equally valid, invisible types of parts such as boundaries 86 shown in Figure 6. The number of different types of part is limited only by the imagination of the compiler of an apparatus functioning under the present invention.

1. Colour	18. Spin Axis Second Angle
2. Texture	19. Spin Sense
3. Rendering	20. Angular Velocity
4. Size	21. Spin Axis Precession Y limit
5. Distance from Reference Plane	22. Spin Axis Precession X limit
6. X-axis position	23. Spin Axis Precession rate
7. Y-Axis position	24. Bounce at X Boundary Y/N
8. Transparency	25. X Coefficient of restitution
9. Rotation Centre	26. Bounce at Y Boundary Y/N
10. Rotation angle	27. Y coefficient of Restitution
11. X-axis velocity	28. Bounce at Z boundary Y/N
12. Y-axis velocity	29. Z coefficient of restitution
13. Z-Axis velocity	30. Viewpoint
14. X-Axis Boundary	31. Blink Timeslots
15. Y=Axis Boundary	32. Blink Rate
16. Z-Axis Boundary	33. Group
17. Spin Axis First Angle	34. Un-group

TABLE No 2: PROPERTIES

Returning to Figure 9, having selected the particular part in the ninth operation 122, a tenth operation 124 specifies the properties of that part. Table 2 gives examples of different properties that can be attributed to a part of the present invention. Table 2 shows only a limited number of examples, and is not exhaustive.

The blink rate determines at what speed substitution animation is to proceed. With a high enough blink rate, and images which form a movement sequence, it is possible to create continuous animation, in real time, which repeats every time the blink timeslots recycle.

Items 33 and 34, grouping and ungrouping, simply allow objects and items to be associated with one another so that they are scaled, moved, blinked on and off etc. together. Ungrouping breaks this association.

The properties defined in Table 2 are given only by way of example. The present invention encompasses smaller sets or larger sets of properties, each of which can be selected and adjusted, according to the requirements of the system.

Turning attention to Figure 9, once the properties have been specified by the tenth operation 124, an eleventh operation 126 allows the user to use the buttons on the mobile telephone 10 to position the particular item in the display 22. If a fourth test 128 detects that the user is satisfied, control passes to a fifth test 130. If the fourth test 128 detects that the user is not satisfied with the placed part, control returns to the tenth operation 124 where the properties can be re-specified.

The fifth test 130 checks to see if the image is complete. If the image is complete, the procedure terminates in exit 132. If the image or scene is not complete, a twelfth operation 134 has the user select a new part type, a thirteen operation 136 has the user view the parts of the new type, and a fourteenth operation 138 has the user select a part of the new type before passing control back to the tenth operation 124 for the user to define the properties of the newly selected part.

Attention is next drawn to Figure 10, which is a flow chart showing how the many different properties a part may require are selected and applied. The flow chart of Figure 10 corresponds to the tenth operation 124 shown in Figure 9.

From entry 140 a sixteenth operation 142 has the user co-operate with mobile telephone 10 to select the first property to be applied. This could be any of the properties suggested in Table 3. For example, the user could select the texture. A sixteenth operation 144 then has the user select a parameter value. The effect of the property and its parameter value is viewed in a seventeenth operation 146. If a sixth test 148 finds that the user is not satisfied with the value he has selected, control is passed back to the sixteenth operation 144. If the viewed effect of the seventeenth operation 146 is satisfactory, control passes to a seventh test 150 which checks to see if all the properties have been selected for the particular part in question. If they have, the routine proceeds to exit 152. If they have not, control passes to an eighteenth operation 154 which allows the user to select the next property to be applied to be part in question. Control then passes back to the sixteenth operation 144 where the user can once again select parameter values.

The procedure of Figure 10 allows the user to select as few or as many properties for a part as is required, and to adjust the effect of the parameter values until a satisfactory result is achieved on the screen 22.

Attention is drawn to Figure 11, Figure 12 and Table 4. Together they explain the manner in which a static or animated image can be sent from one mobile telephone 10 to another mobile telephone 20 using a simple coding scheme which, in this example, is a simple text message.

Because of the tremendous variety which can be achieved using a relatively small number of parts, properties and property values, it is feasible to send a complex image with or without animation from one mobile telephone 10 to another mobile telephone 20 using a simple text message structure. In the example chosen, and described in Table 4, only upper case letters have been used. Giving twenty-five different values to each part of the message allows, in just ten characters, over 10^{14} different possibilities. If the upper case and lower case letters are used, over 10^{17} different

combinations are possible. If letters are abandoned, and an eight-bit byte is adopted as the unit, the number of possibilities rises to over 10^{24} in just eight-bit bytes. Under the terms of the present invention, any form of coding can be used. The upper case letters example has been chosen for simplicity of explanation. The use of a text message using ordinary letters has been chosen because the technology already exists within mobile telephones 10 and because it is then possible for a user to memorise a character string which can then be keyed in, manually if necessary, and sent to another mobile telephone 10.

Attention is drawn in particular to Figure 11, showing how a mobile telephone 10 constructs a text message sending an image.

From entry 156 an eighteenth test 158 determines whether or not the user wishes to send an image. If the user does not wish to send an image, a nineteenth operation 160 continues with whatever other and ordinary operations the mobile telephone 10 usually conducts. If the user does wish to send an image, a twentieth operation 162 recalls, from a memory within the mobile telephone 10, the part identifiers for the different parts that occur in the image. A twenty-first operation 164 then recalls, from the memory in the mobile telephone 10, the properties associated with each part recalled in the twentieth operation 162 and a twenty-second operation 166 matches up each part and their respective properties. A twenty-third operation 168 then forms a concatenated queue of characters, in the correct order, representing the individual parts and their selected properties. This concatenated queue of part identifiers and property selectors is sent, as a simple text message, to the receiving mobile telephone 10, in a twenty-fourth operation 170. The image sending process then terminates in an exit 172.

Attention is next drawn to Figure 12, showing the manner in which a receiving mobile telephone 10 can receive and reconstruct an image sent from a sending mobile telephone 10.

From entry 174 a twenty-fifth operation 176 receives the image representative text message and can store it, in much the same way that an ordinary text message is stored. Either immediately, or at a later time determined by the user of the receiving mobile telephone 10, a twenty-sixth operation 178 identifies the first part to be included in the scene represented by the text message. A twenty-seventh operation 180 then retrieves that identified part from the memory of the receiving mobile telephone 10. It is to be recalled that both the sending mobile telephone 10 and the receiving mobile telephone 10 have, stored in their memories, a library of parts which can be called forth by identifiers, manipulated, adapted, and provided for the display on the screen 22.

Thereafter a twenty-eighth operation 182 determines the properties to be applied to the identified part and applies those properties thereto. A twenty-ninth operation 184 then places the identified part, with its properties, on the display screen 22.

A ninth test 186 checks to see if there are any remaining part of the received message from the twenty-fifth operation 176 which still need to be processed. If there are, a thirtieth operation 190 identifies the next part in the received and stored text message, and passes control back to the twenty-seventh operation 180 so that the next part may be qualified by application of its properties and its placement on the display screen 22.

When the ninth test 186 detects that the final part of the received and stored text message from the twenty-fifth operation 176 has been processed, a thirty-first operation 190 starts up any animation which has been included in the image, and proceeds to exit 192.

Not shown on Figure 12 is the possibility of the receiving mobile telephone 10 storing the reconstructed image in a separate memory. In fact, this is not necessary, since the received text message is already stored in the twenty-fifth operation 176 and can be otherwise stored to be recalled at any time.

PURPOSE OF ITEM IN TEXT MESSAGE	NATURE OF ITEM IN TEXT MESSAGE
1. Graphic delimiter (start)	**
2. Part Type Identifier	One of A-Z (26 different types)
3. Part Identifier	One of A-Z (26 different parts)
4. Position Identifier	One of A-Z(26 different places)
5. Property delimiter (start)	#*
6. Property identifier	One of A-Z (26 different types)
7. Property value	One of A-Z (26 possible values)
8. Property identifier	One of A-Z (26 different types)
9. Property Value	One of A-Z (26 possible values)
10. Property delimiter (end)	*#
11. Part Type Identifier	One of A-Z (26 different types)
12. Part Identifier	One of A-Z (26 different parts)
13. Position Identifier	One of A-Z(26 different places)
14. Property Delimiter (start)	#*
15. Property Identifier	One of A-Z (26 different types)
16. Property Value	One of A-Z (26 possible values)
17. Property Delimiter (end)	*#
18 Graphic Delimiter	##

TABLE 3: Exemplary Scheme To Send Images By Text Message

Attention is drawn to Table 3, showing one example of a coding scheme whereby an image could be sent as a text message.

The left hand column of Table 3 shows the purpose of an item in a text message and the right hand column shows possible exemplary representations of what that item could be.

The first required element is a graphic delimiter. It is necessary to indicate that an item, being received, is an image. In this example, a double asterisk, never occurring in normal text messages, is chosen as the graphic delimiter.

The next element to be conveyed is a part type delimiter. This is intended to indicate that a particular type of part (see Table 1) is about to be indicated. The third element is a part identifier. This identifies which one of a particular type of part is to be seen in the image. A position identifier indicates where, on the screen 22, the selected part is to be positioned. The second, third and fourth elements in Table 3 are each, in this example, designated as having one of the characters A to Z as the indicator. Even in the restricted range of this example, this permits over 17,000 different combinations of sorts of parts and positions.

Having selected a part and where it is to be on the screen 22, the next thing to determine is what properties that part should have. A property delimiter is chosen, in this example, to be another combination unlikely in the normal text message, the hash symbol followed by the asterisk.

In this example, in Table 3, the sixth and seventh elements are a property identifier, to identify which property is to be selected, and a value for that property (earlier called parameters). As many different properties can be selected as are possible for that part. As an example, in Table 3, the eighth and ninth elements are a further property identifier followed by a further property value. As many pairs of property identifiers and property values as are necessary can be included. The property denomination process is terminated in a property delimiter for the end of the properties, in this example chosen as the asterisk followed by the hash.

In the example of Table 3, another part type identifier follows the property delimiter for the end of the properties. This is indicative of the fact that more than one part can be sent in the text message. The text message comprises a graphic delimiter called the start (**), a sequence of part type identifier followed by part identifier, position identifier and property identifiers, to be followed by another part type identifier and another part. This process continues until all the parts and all their properties have been included in the text message. When it is the end of the image representative text message, a graphic delimiter (item 18 in

Table 3) is sent to show that the image representative text message is at an end. Once again, a combination of symbols (##) which is unlikely to occur in a normal text message, is chosen.

Table 3, of course, is just an example. Many other schemes of symbols and ordering of identifiers would also work and would also fall within the present invention.

EXEMPLARY TEXT MESSAGE	POSSIBLE MEANING
1) **AD#*GMPD*#BC#*GMANPW*###	**(start picture)A(select face) D(Long oval face) #*(with properties) G(position) M(centre screen) P(shade) D(dark) *#(end of properties) B(select eyebrows) C(bushy eyebrows) #*(with properties) G(position) M(centre screen) A(tilt Angle) N(just above horizontal) P(shade) W(light) *#(end of properties) ##(end of picture)

2) **GS#*GAXDYWRA*#GC#*GZXWYARA*## #	**(start picture) G(select a geometric object) S(a star) #*(with properties) G(position) A(bottom left of screen) X(X-Axis velocity) D(quite slow) Y(Y-Axis velocity) W(quite high) R(coefficient of restitution on rebounding from edge of screen) A(100%) *#(end of properties) G(select geometric object) C(a sphere) #* (with properties) G(position) Z(top right of screen) X(X-Axis velocity) W(quite high) Y(Y-Axis velocity) D(quite low) R(coefficient of restitution when rebounding from edge of screen) A(100%) *#(end of properties) ## (end of picture)

TABLE 4: POSSIBLE EXEMPLARY PICTURES AND ANIMATIONS SENT BY TEXT MESSAGE

Finally, attention is drawn to Table 4, showing some exemplary text messages according to the scheme of Table 3. The values of the letters have been arbitrarily chosen to provide an exemplary narrative. In the first example, a long, oval, dark shaded face has been placed in the centre of the screen 22 and has had slightly tilted, bushy, light eyebrows placed thereon. This is an example of a static image. In the second example, a star, starting at the bottom left of the screen, with a slow X-axis velocity and a high Y-axis velocity rebounds from the edge of the screen with 100% coefficient of restitution while, at the same time, a sphere, starting at the top, right hand side of the screen with a high X-axis velocity and a low Y-axis velocity and a 100% coefficient of

restitution also bounces from the boundary of the screen 22. This is an example of a simple animation.

It is to be appreciated that more complex scenes would require longer text messages.

The present invention has been described by way of an example relating to mobile telephones 10. As earlier stated, it is to be appreciated that the present invention can be applied to any system or apparatus where an image can be sent for display on a screen.

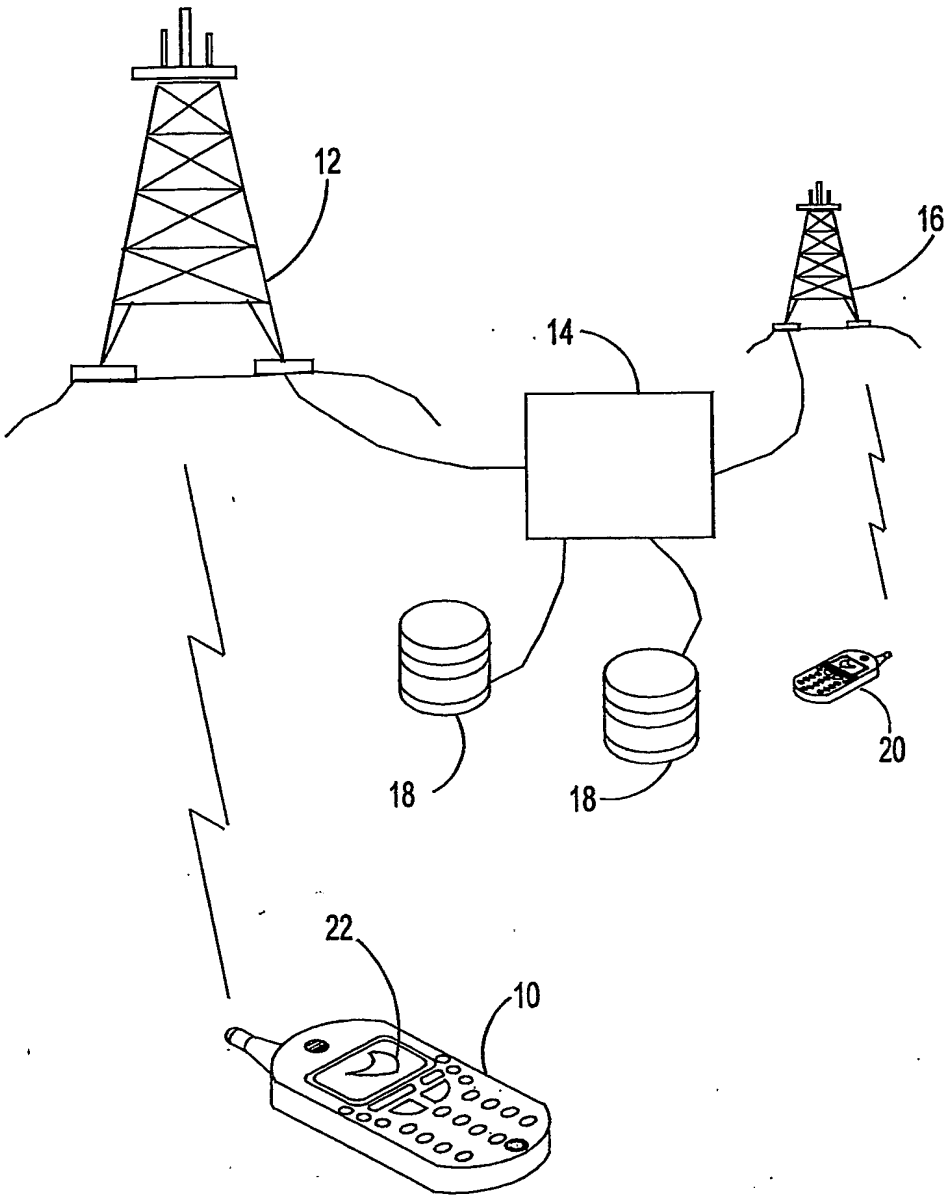


FIGURE 1

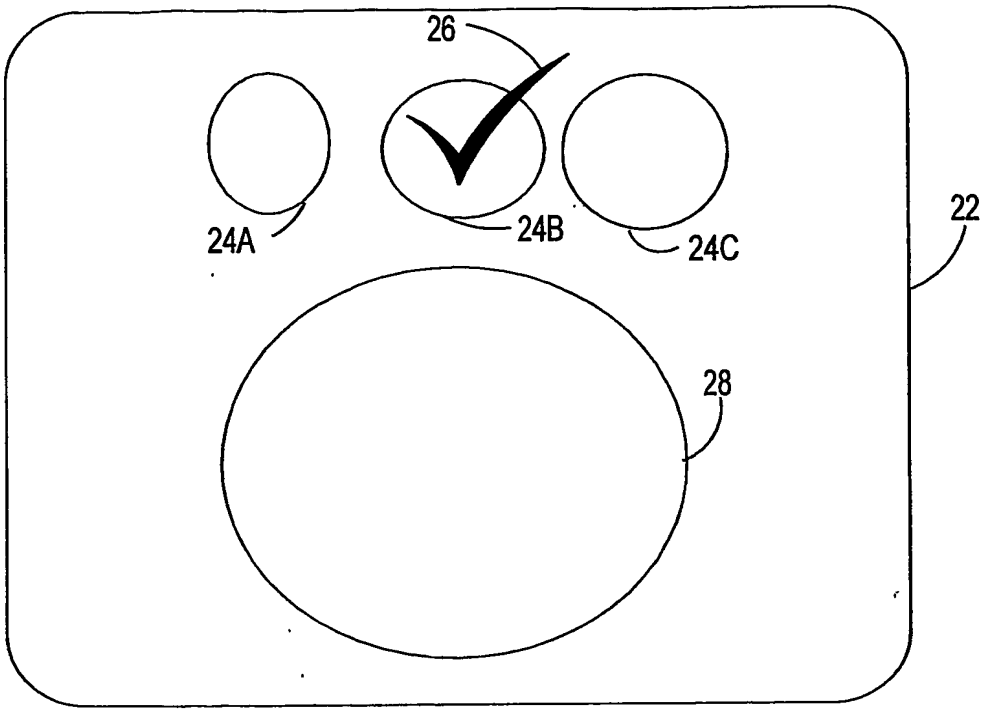


Figure 2A

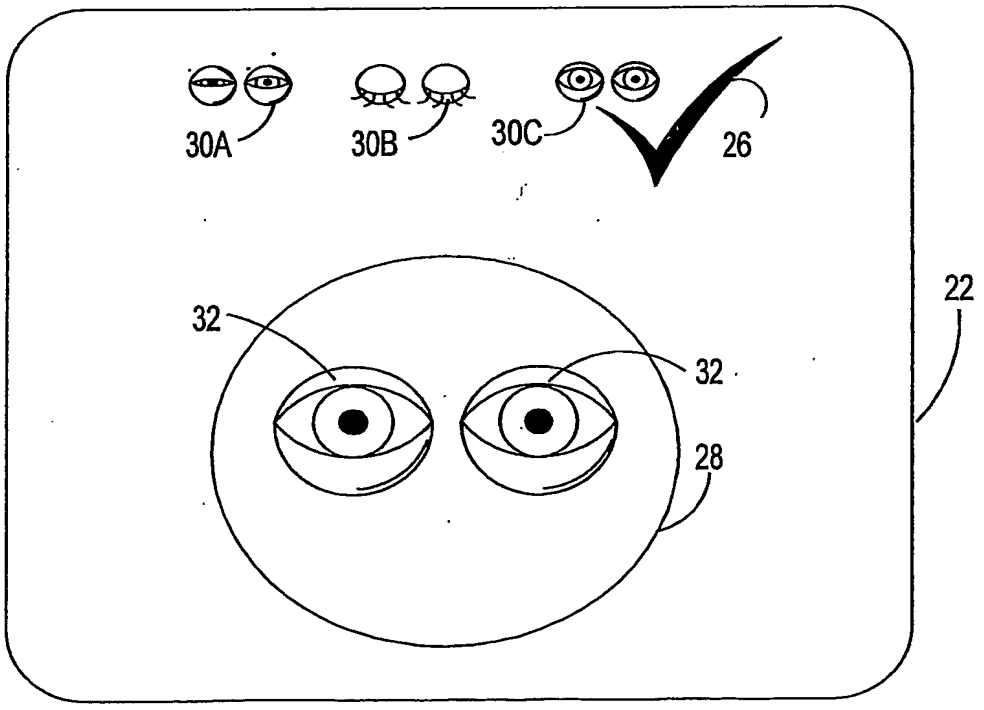


FIGURE 2B

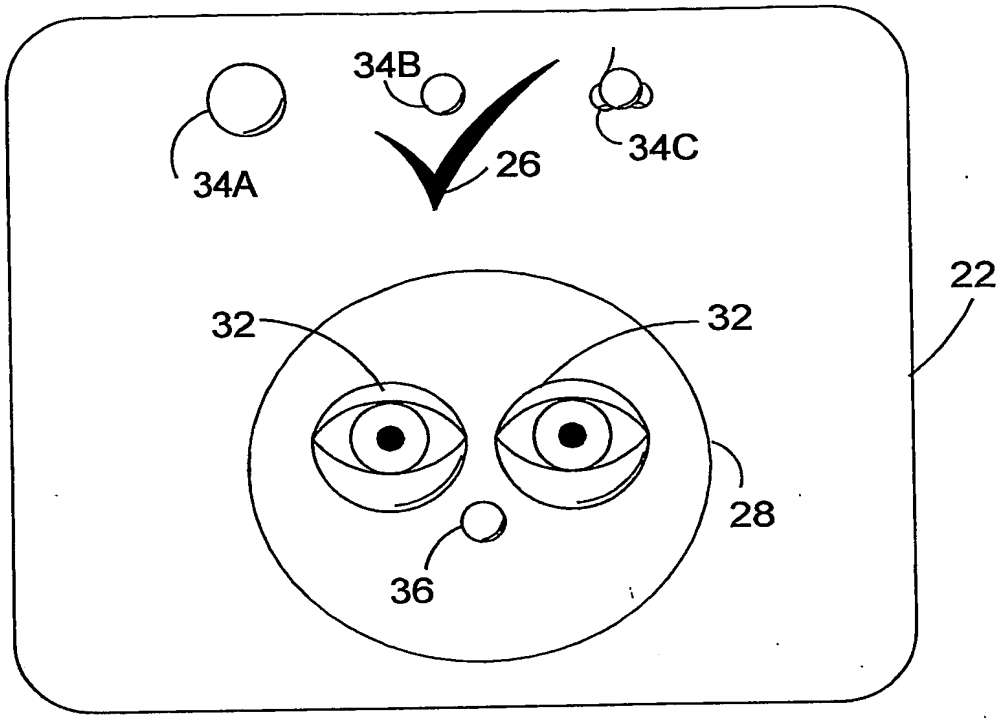


FIGURE 2C

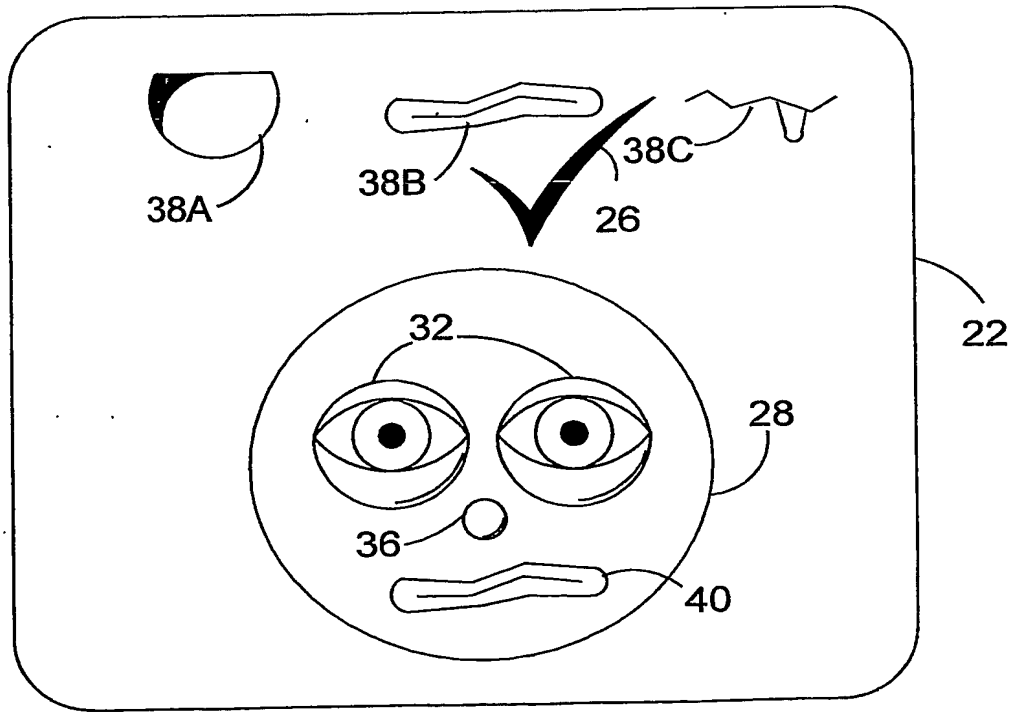


FIGURE 2D

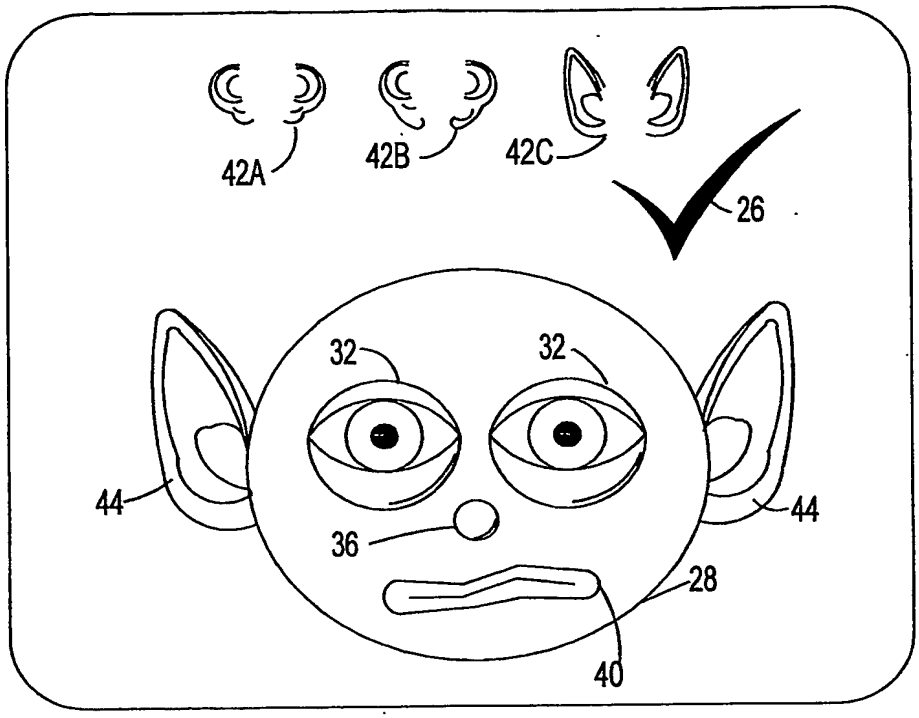


FIGURE 2E

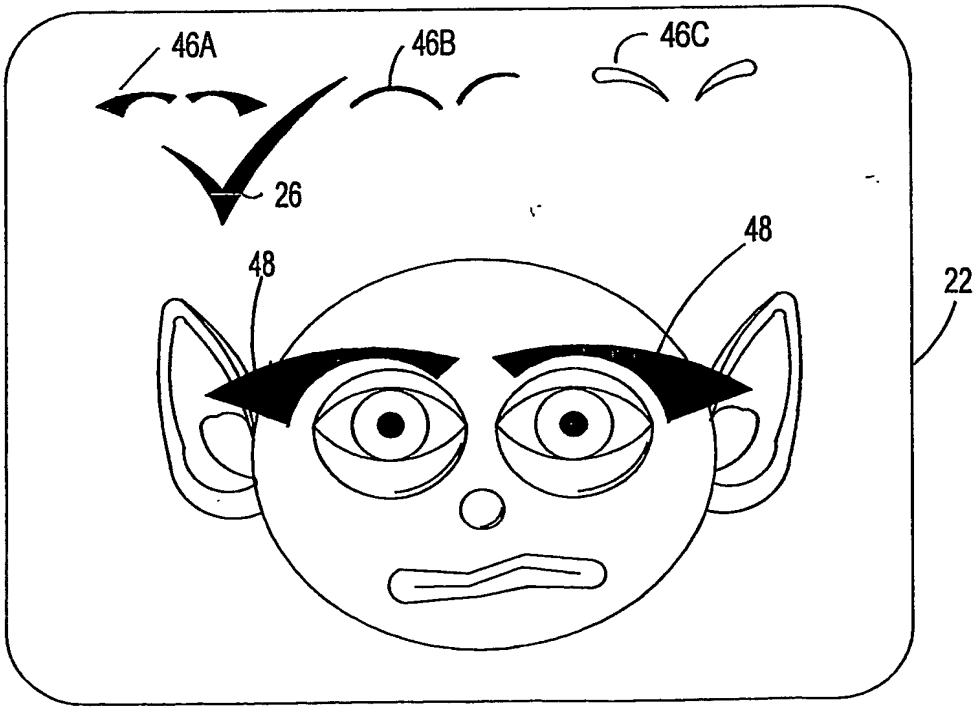


FIGURE 2F

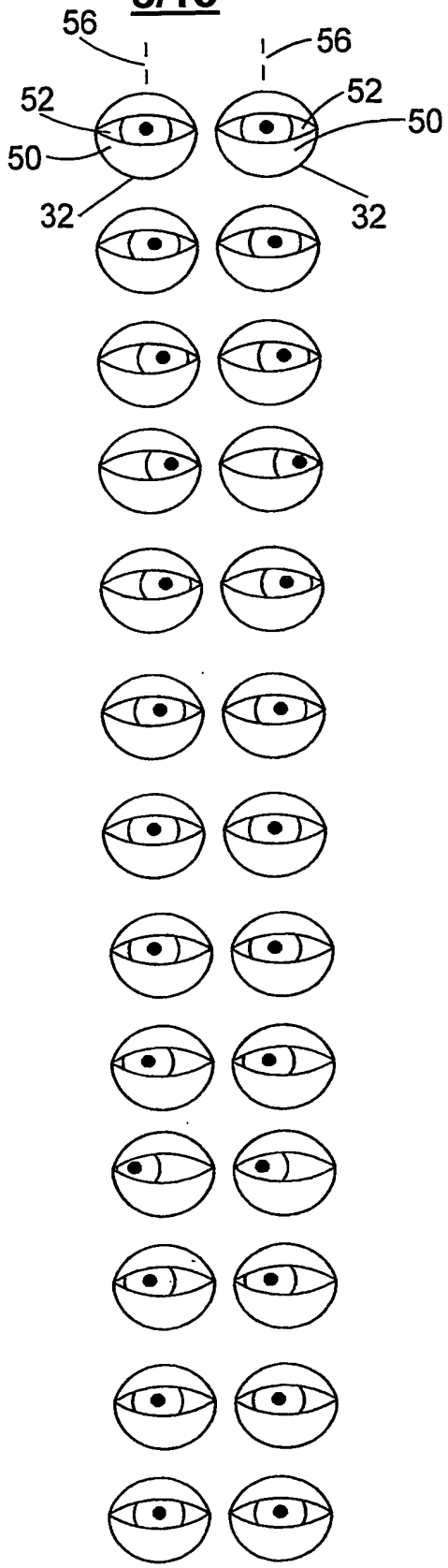


FIGURE 3

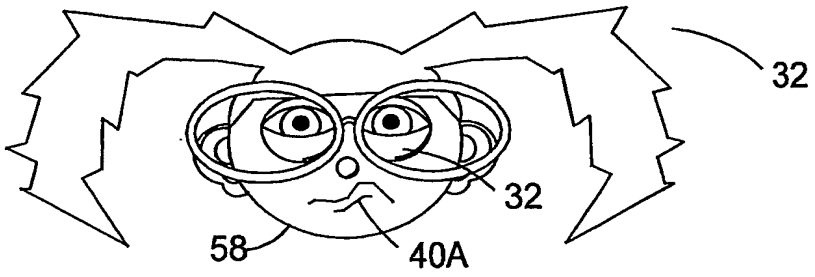


FIGURE 4A

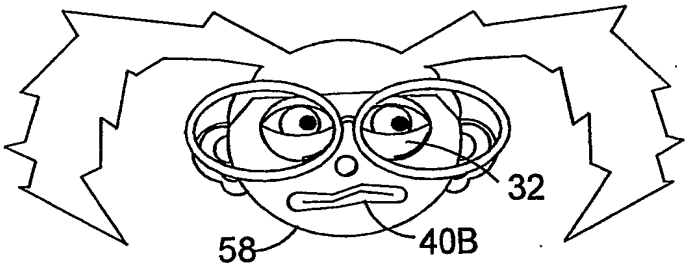


FIGURE 4B

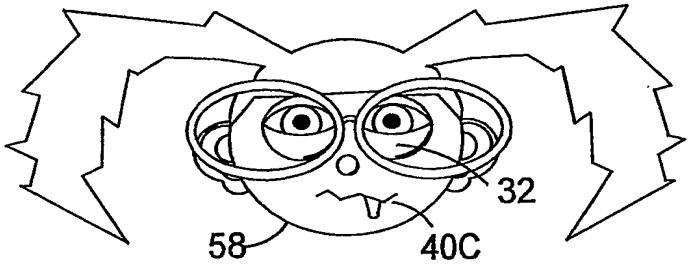


FIGURE 4C

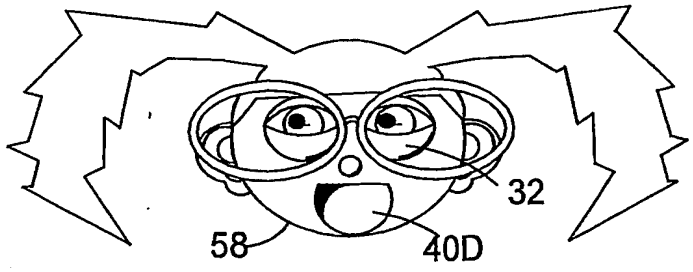


FIGURE 4D

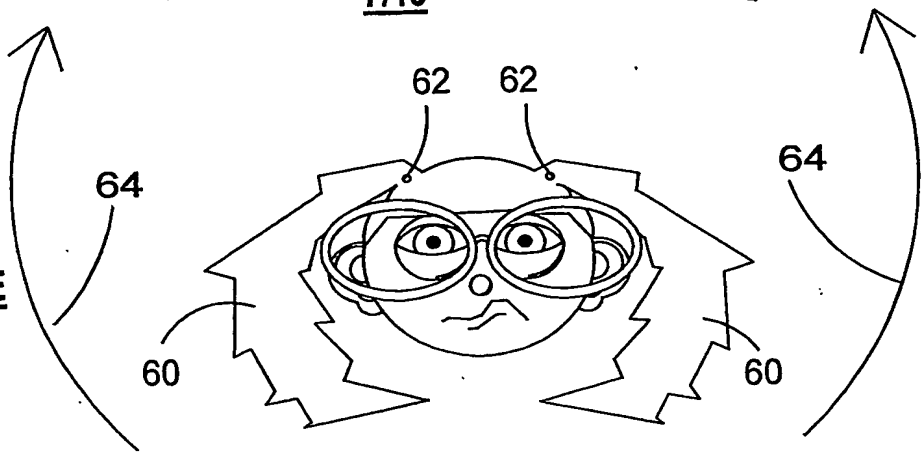


FIGURE 4E

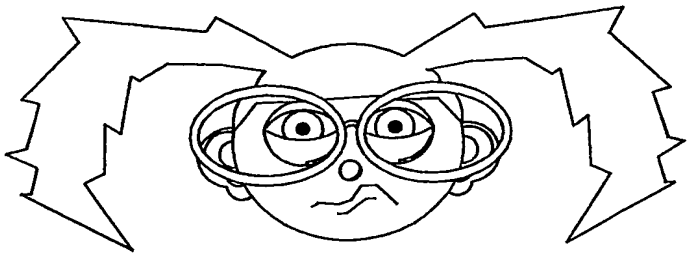


FIGURE 4F

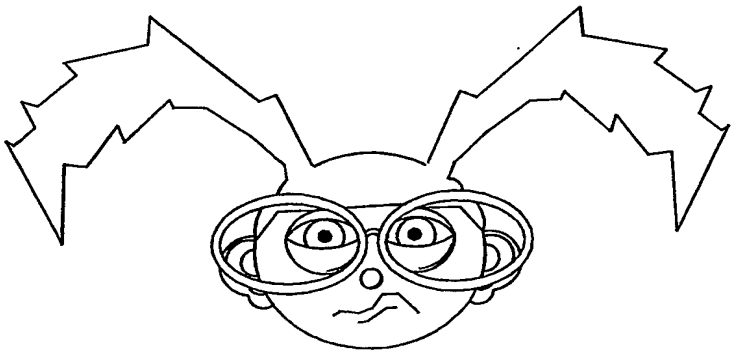


FIGURE 4G

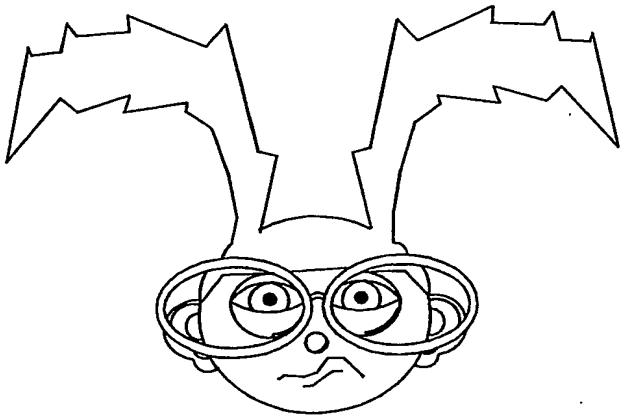


FIGURE 4H

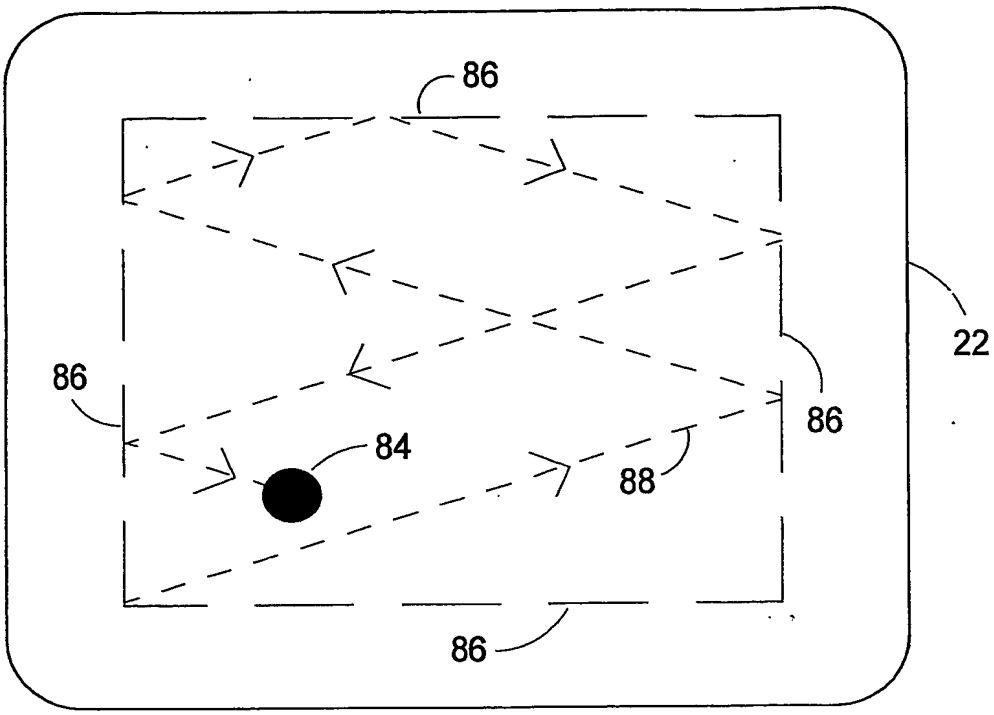


FIGURE 6

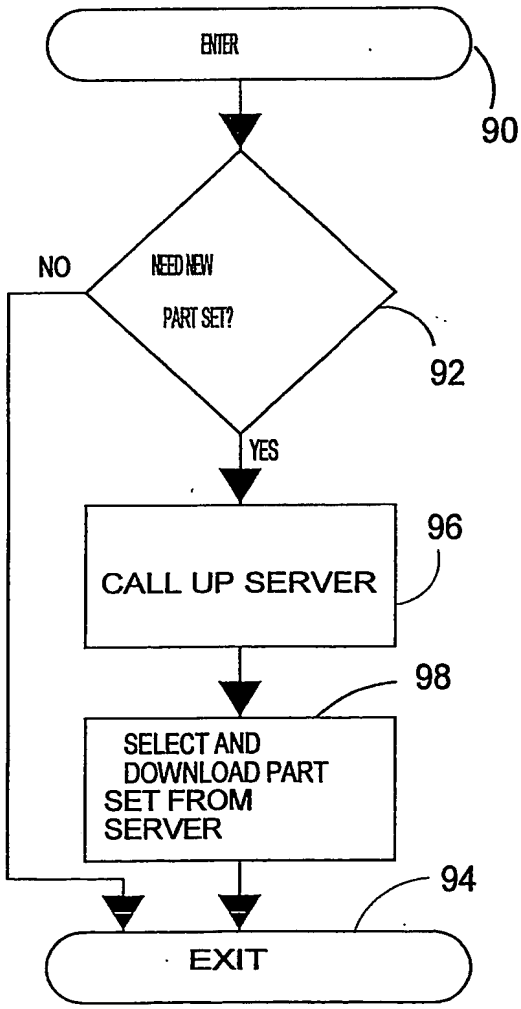


FIGURE 7

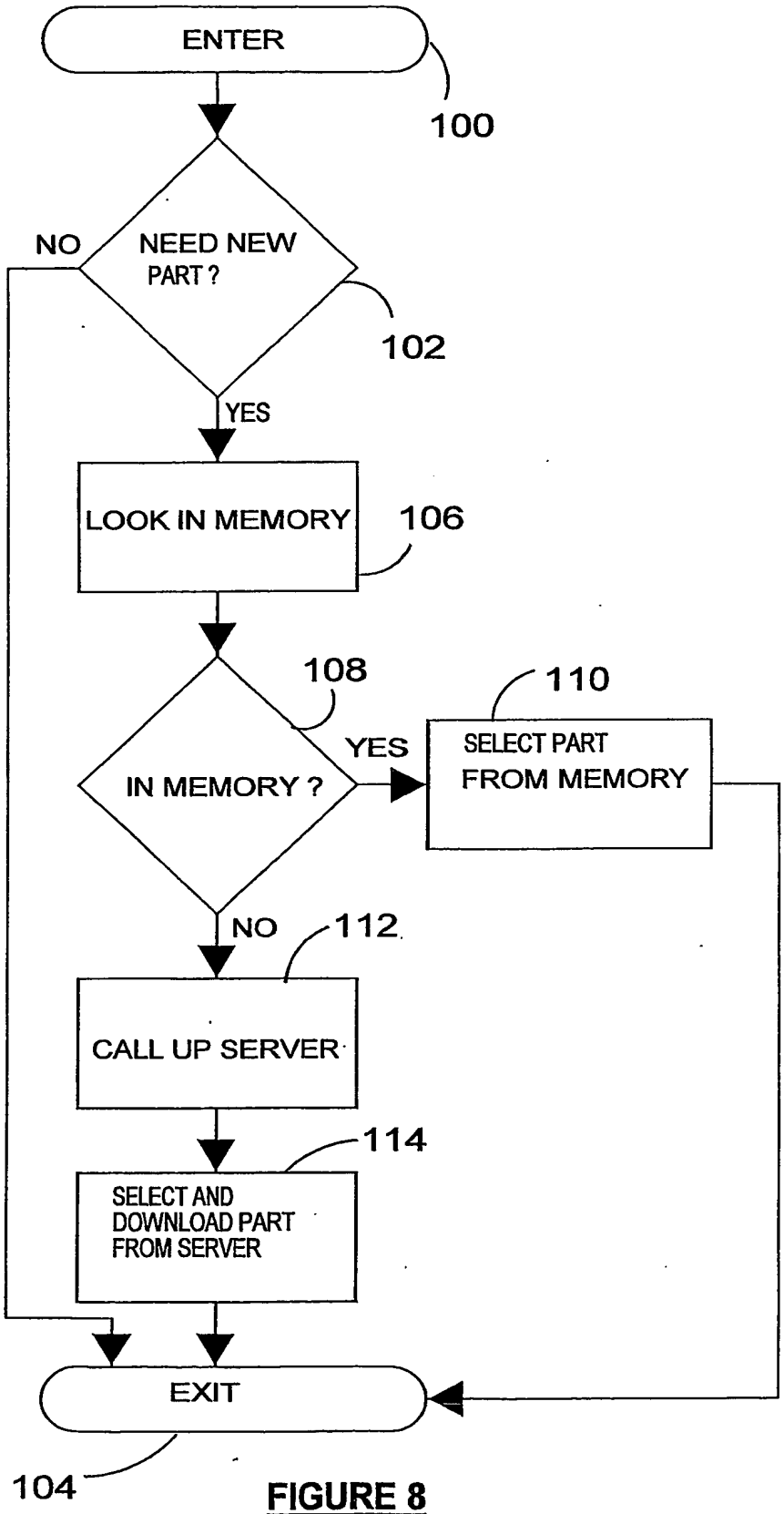

ENTER
100
NEED NEW PART ?
NO
102
YES
LOOK IN MEMORY
106
108
IN MEMORY ?
YES
110
SELECT PART FROM MEMORY
NO
112
CALL UP SERVER
114
SELECT AND DOWNLOAD PART FROM SERVER
EXIT
104

FIGURE 8

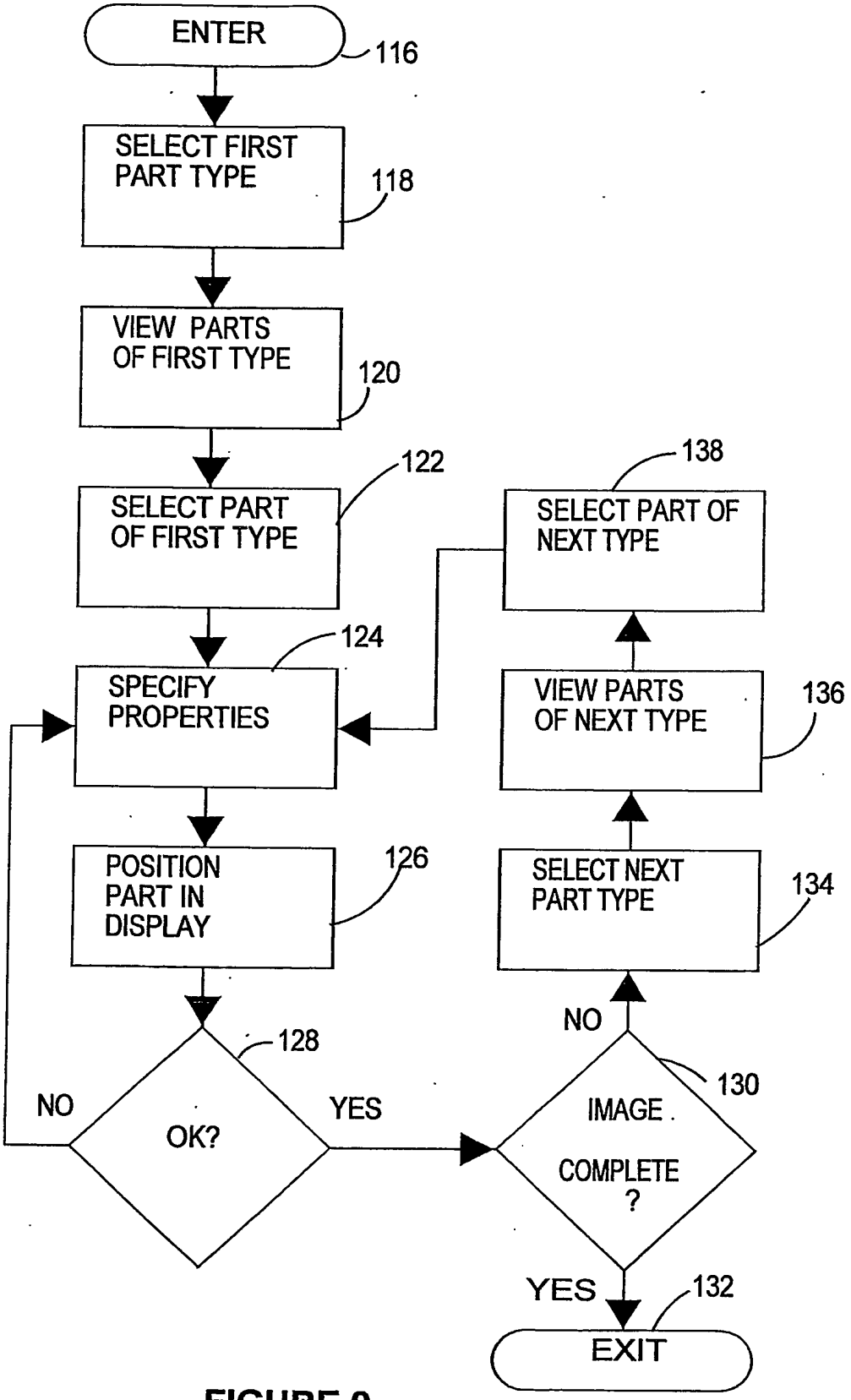

ENTER
116
SELECT FIRST PART TYPE
118
VIEW PARTS OF FIRST TYPE
120
SELECT PART OF FIRST TYPE
122
SPECIFY PROPERTIES
124
POSITION PART IN DISPLAY
126
OK?
128
NO
YES
IMAGE COMPLETE ?
130
NO
YES
EXIT
132
SELECT NEXT PART TYPE
134
VIEW PARTS OF NEXT TYPE
136
SELECT PART OF NEXT TYPE
138

FIGURE 9

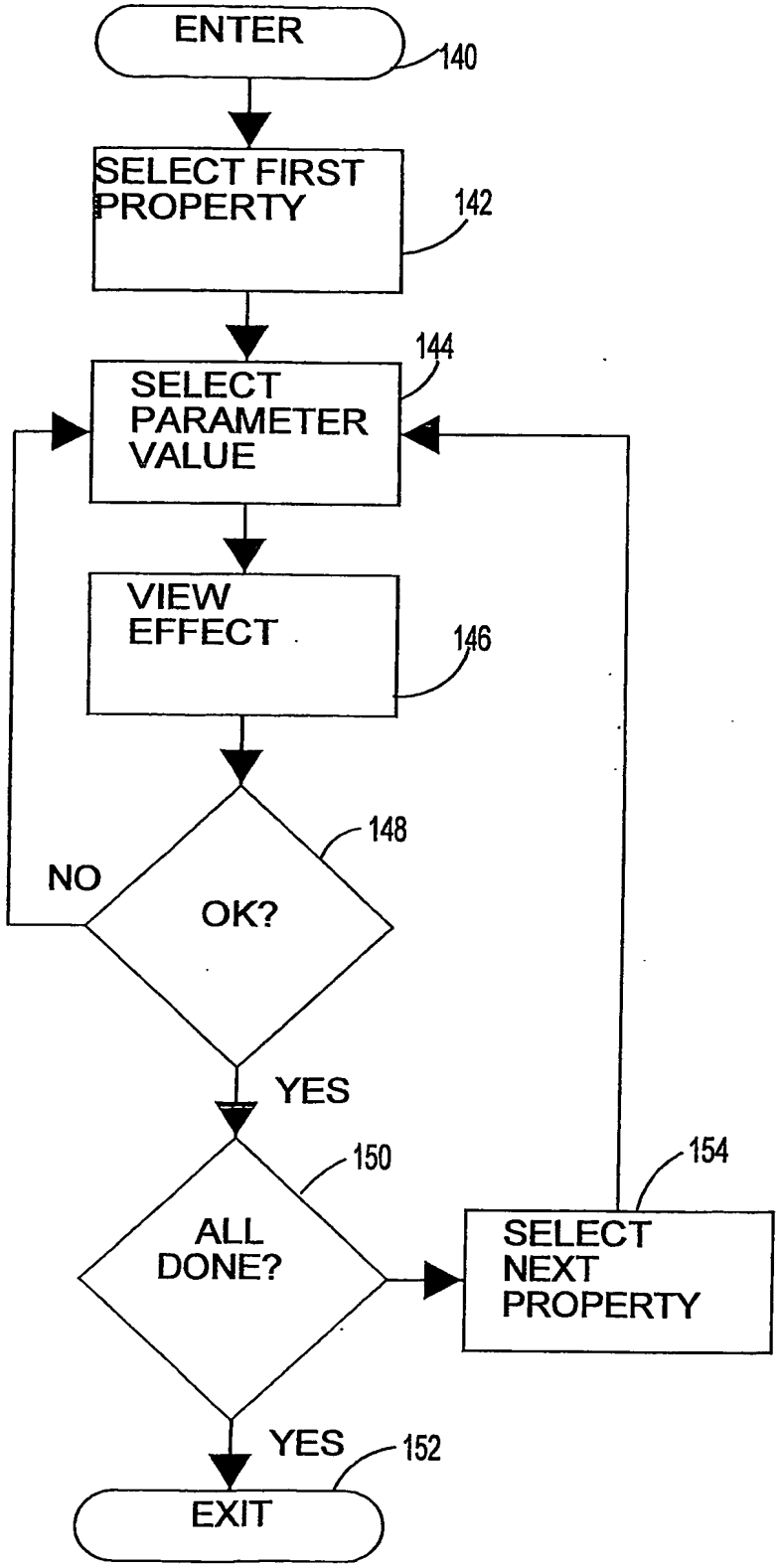

ENTER
140
SELECT FIRST PROPERTY
142
144
SELECT PARAMETER VALUE
VIEW EFFECT
146
148
NO
OK?
YES
150
ALL DONE?
154
SELECT NEXT PROPERTY
YES
152
EXIT

FIGURE 10

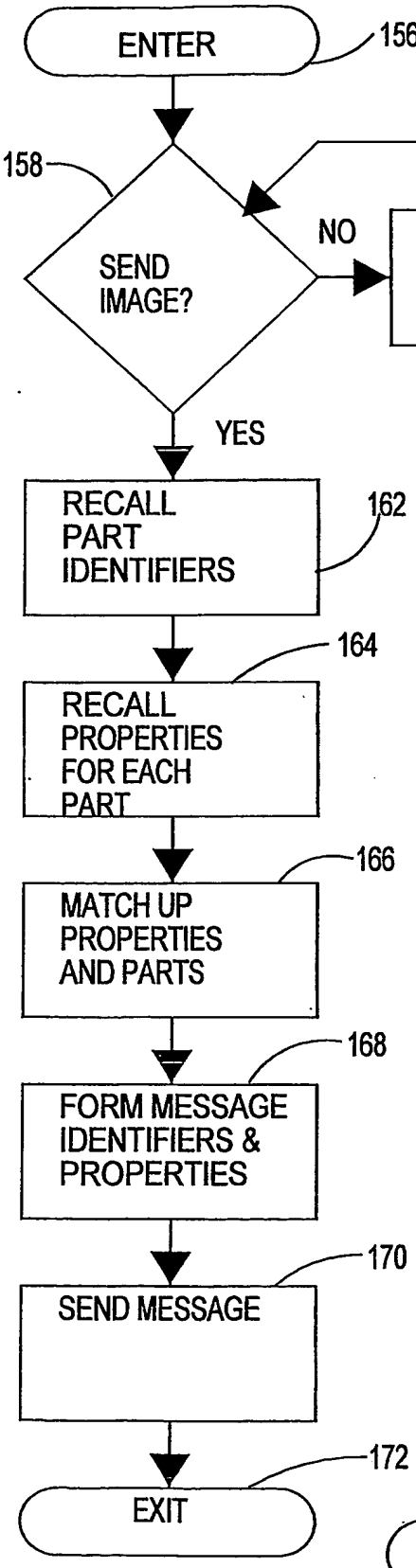


FIGURE 11

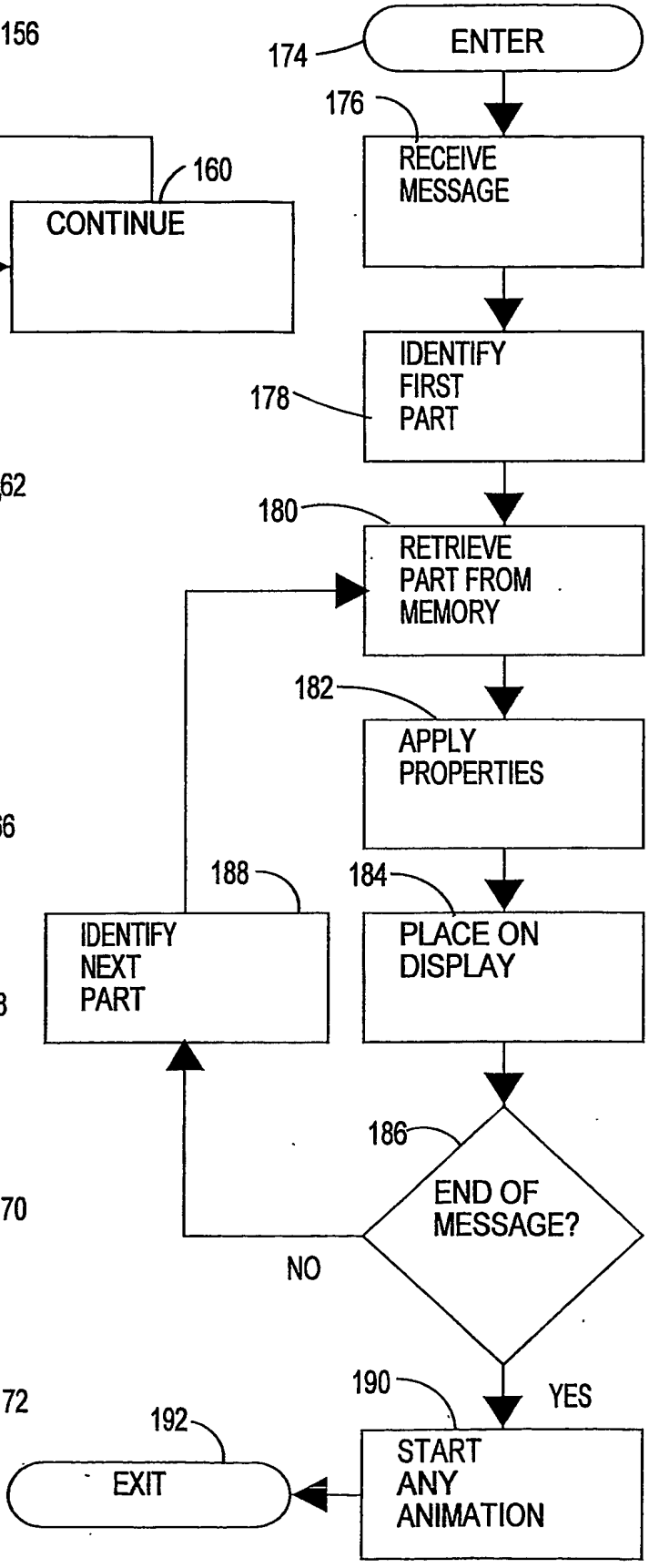


FIGURE 12

This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☑ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.
As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.